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The Dewey Decimal Classification and the International Catalogue of Science.

BY

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The Dewey Decimal Classification and the International Catalogue of Science.

THE rapid increase in the growth of scientific literature, and the consequent need for a systematic bibliography, have given rise to many schemes, more or less extensive, for keeping scientific workers informed, with as little delay as possible, of the publication of books and memoirs in their special departments. The history of works of this kind shows a gradual evolution, with ever increasing adaptation to the environment as regards completeness, classification, and rapidity of publication. To take an illustration from that branch of science with which I am most familiar:—The "Bibliotheca Historico-naturalis" of Engelmann, published in 1846, was succeeded, in 1861, by the "Bibliotheca Zoologica" of Carus and Engelmann. Then followed, in 1864, the *Zoological Record*, published annually, whilst in 1878 the fortnightly issue of the *Zoologischer Anzeiger* of Carus began, and is now continued with somewhat modified organisation in conjunction with the zoological bureau of Dr. H. H. Field.

In the case of a bibliography which is issued in sections, one of the most urgent needs is the classification of the titles, so that students may readily select the references which concern them; and of practical devices for securing this end, the use of a scheme with numbered divisions seems to have been generally approved. The advantages of such a system are obvious: when the list of classes has once been drawn up and the numbers affixed to them, the latter do duty for the headings of the former (*e.g.*, 595 may stand for *Arthropoda* or 853 for *Italian fiction*), with great advantage as regards brevity. Furthermore, a series of slips or titles, if arranged numerically, are thereby put in systematic order. Thirdly, the numbers with which one is habitually working become fixed in the memory and thus facilitate the looking up of references and the arrangement of facts and materials of all kinds; whilst, lastly, the ease of cross-reference is greatly increased. Hitherto the scheme based on these principles which has been most widely used, is undoubtedly the "Decimal Classification" of Melvill Dewey, and its adoption in the pages of this Journal, in those of the *Revue scientifique*, and of the *Zoologischer Anzeiger*, as well as some dozen other periodicals less connected with natural science, renders it appropriate to devote a little space to its exposition. This is the more needful as those who see the numbers for the first time, and who lack the patience or leisure to acquire a grasp of the system on which they are based, are very apt to be prejudiced against it, condemning it unheard as an artificial and cumbrous device.

The system consists in dividing the subjects on which books have been written into classes and fixing a number to each. There are ten main divisions; each of these is subdivided into ten, and each of these once more into ten, so that 1,000 so-called "sections" are formed. The "Natural Sciences" (in the wide sense of the term) occupy the sections, 500–599, whilst "Zoology" extends from 590 to 599, the several class-numbers being allocated thus:—

590.	General Zoology.
591.	Anatomy and Physiology.
592.	Invertebrata.
593.	Protozoa, Porifera, Coelenterata.
594.	Mollusca, Brachiopoda, Bryozoa, Tunicata.
595.	Articulata.
596.	Vertebrata.
597.	Pisces, Amphibia (Ichthyopsida).
598.	Reptilia, Aves (Sauropsida).
599.	Mammalia.

By the use of decimals, these sections are further divided into sub-sections to any degree of minuteness which may be desired; for instance, 595.3 is "Crustacea," subdivided thus:—

595.31	Entomostraca.
.32	Phyllopoda.
.33	Ostracoda.
.34	Copepoda.
.35	Cirripedia.
.36	Malacostraca.
.37	Arthrostraca.
.38	Thoracostraca.
.39	Gigantostraca.

By the mere addition of decimal places, any one of these may be divided and subdivided again, if at any time that be deemed desirable. The insertion of the decimal point makes the proper order of the divisions clear, and also makes it more easy for the eye to catch the main class-number. There is no profound mystery in this use of the decimal; it is nothing more than a practical convenience.

In order to indicate Geographical distribution, a series of numbers has been allotted to the different divisions of the earth's surface:—

.4	Europe.
.41	Scotland, Ireland.
.42	England.
.43	Germany.
&c.	&c.
.5	Asia.
.6	Africa.
.7	North America.
.8	South America.
.9	Oceania.

These numbers, *always with the same signification*, can be added to the number belonging to any subject which admits of being considered geographically, whether it be poetry or periodicals, beetles or mosses; and numbers are provided for carrying out the subdivisions as far as the countries in the British Isles or the States of the American Union.[1]

Those who wish to see the whole system set forth should consult Dewey's original work,[2] and I may, perhaps, be allowed to refer any who are curious to see it applied to the literature of natural science, to an effort of my own to carry out its principles.[3]

Such, in briefest outline, is the Decimal Classification of Melvill Dewey, which has been published for more than twenty years, has been adopted by upwards of 300 libraries in America, in this country, and on the Continent, and is now used by Messrs. Lafontaine and Otlet in the various publications issued by the Institut International de Bibliographie at Brussels, and by Dr. Field in the work of the "Concilium bibliographicum" at Zürich. My own experience, extending over the past five years, enables me to speak of it with great confidence as a thoroughly practical scheme, though I confess, on first acquaintance, I regarded it with considerable suspicion; and I have never met anyone, who had given it a fair trial, that was not deeply impressed with its many valuable qualities.

It is, of course, obvious that Decimal classification and the Dewey classification are not necessarily united. Any number of schemes might be elaborated, and decimal class-numbers applied to them: in fact, within the last few months a rival champion has entered the lists against the American system, under the auspices of no less a body than the International Catalogue Committee of the Royal Society, and it behoves all who are interested in the conflict (which means practically all scientific men) to make a critical examination of the combatants before deciding which they will back. At the outset it may be observed that it is incumbent on the new-comer to show marked superiority over the present champion, for in its absence the well-known principle would be applied—namely, that it is better to adopt a classification which has been long in print and is widely adopted, unless the superior merits of the new one fully compensate for the change.

We may now proceed to examine a few sections of the Royal Society's scheme, confining our attention to those that relate to topics treated of in NATURAL SCIENCE. One of the most conspicuous features of the Dewey scheme is the wide application of many of its groups of numbers: for example, each branch of science has the following divisions:—

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[1] [In this Journal, the numbers indicative of geographical divisions have been added within round brackets, a method proposed, for the avoidance of confusion, by the Brussels Institute, and now generally adopted.—ED. NAT. SCI.]

[2] DEWEY, Decimal Classification and relativ index. Fifth Edition, 1894. Library Bureau, Boston, 146 Franklin Street, and London, 21 Bloomsbury Street. Price 25s.

[3] Manchester Museum Handbooks. Catalogue of the books and pamphlets in the Library Manchester: Cornish. 1895 Price 2s. 6d.

.1 Philosophy, Theories, Nomenclature.
.2 Handbooks ("Compends" of Dewey).
.3 Dictionaries.
.4 Essays, Tracts.
.5 Periodicals.
.6 Societies ("Academies" of the Brit. Mus. Cat.).
.7 Study, Teaching, Museums.
.8 Collected Works.
.9 History.

These are applied alike to all main divisions from "Religion" to "Useful Arts"; whereas in the Royal Society scheme nothing is said of these subdivisions in Anthropology or Zoology, in Botany the Dewey plan is followed, and in Geology and its subdivisions we have:—

	Geology, General.	*Mineralogy.*	*Palæontology.*
.1	History, Philosophy.	Literature.	History, Philosophy.
.2	Handbooks.	Classification.	Handbooks.
.3	Dictionaries.	Nomenclature.	Dictionaries.
.4	Tracts, Ephemera.	Teaching.	Tracts, Ephemera.
.5	Periodicals.	Museums.	Periodicals.
.6	Societies.	..	Societies.
.7	Education.	..	Research and Education.
.8	Research.	..	Classification and Nomenclature.
.9	Museums.	..	Collections and Museums.

Here "teaching" and "museums," though intimately connected in practice, are disjoined, and no place is left for collected works.

Again, as we have already mentioned, the geographical numbers of Dewey form a single rational system of universal application, and therefore easily remembered, but here we have the following choice assortment:—

	Anthropology.	*Botany.*	*Zoology* A.	*Zoology* B.	*Geology.*
.1	..	..	Europe	Palæarctic	Europe.
.2	Europe	..	Asia	Ethiopian	Asia.
.3	Asia	..	Australia	Indian	Africa.
.4	Africa	Europe	Africa	Australian	Australia and Polynesia.
.5	America	Asia	N. America	Nearctic	N. America.
.6	Australasia and Oceania	Africa	S. America	Neotropical	S. America.
.7	Outlying Islands	N. America and Islands	Pacific Archipelago	Oceans beyond 100 fathoms.	Arctic.
.8	Widely diffused races	S. America and Islands	Atlantic Islands	..	Antarctic.
.9	..	Australasia & Polynesia	Oceans beyond 100 fathoms.	..	..

It seems hardly worth while to criticise these schemes individually; they may be allowed to answer one another. The alternative classification of zoology, however, calls for a few comments. There can be no doubt that although the faunistic regions of Wallace and Sclater may be more scientific, nevertheless the old political divisions are far more frequently used by zoological writers, and a scheme based upon them would be of far wider utility than one based on the other. Probably, however, works treating of the animals of regions will become more numerous, and an alternative scheme which provided for them in some simple manner would be acceptable. The only one of the Royal Society systems which deals with geographical divisions smaller than continents is Geology, where we have, for example, Europe divided thus :—

.11 Austrian Empire.
.12 British Islands.
.13 France and Belgium.
.14 German Empire, Holland, and Denmark.
.15 Italy, Sicily, and Malta.
.16 Russia.
.17 Scandinavia.
.18 Spain and Portugal, Balearic Islands.
.19 Turkey, Greece, Balkan States, and Islands of Levant.

The choice of an alphabetical arrangement here is rather incomprehensible; it separates Germany and Austria, and we fail to see that it presents any advantage to justify its adoption as against Dewey's :—

.1 Scotland and Ireland.
.2 England.
.3 Germany and Austria.
.4 France.
.5 Italy.
.6 Spain and Portugal.
.7 Russia.
.8 Norway, Sweden, Denmark.
.9 Iceland, Netherlands, Belgium, Switzerland, Turkey, &c.

Turning to the Animal Kingdom, we demur at the outset to the suggestion that a different classification should be adopted for recent and fossil forms, thus :—

	Fossil Zoology.	*Recent Zoology.*
.1	Protozoa, Porifera, Coelenterata.	Protozoa, Mesozoa, Porifera, Coelentera.
.2	Echinodermata.	Echinoderma.
.3	Vermes, Molluscoidea.	Polyzoa, Gephyrea, Brachiopoda.
.4	Mollusca.	Nematoda, Acanthocephala, Chætognatha, Gastrotricha.
.5	Arthropoda.	Plathelminthes, Nemertini.
.6	Fishes, Amphibia.	Chætopoda, Hirudinea, Rotifera.
.7	Reptiles, Birds.	Arthropoda.
.8	Mammalia.	Mollusca.
.9	Traces of Animals (footprints, etc.) Animals incertæ sedis.	Chordata.

The arrangement of recent animals is undoubtedly more up-to-date than that of Dewey, but as a working system it is vastly inferior to it, doubtless from want of experience on the part of the compiler. To devote a whole decimal place to the Nematoda, Acanthocephala, Chætognatha, and Gastrotricha, the titles referring to which in a year would probably fill a couple of pages of the *Zoological Record*, and to allot the same to the whole of the Chordata, the titles relating to which occupied seventy-five pages in the *Record* for 1894, shows a curious sense of proportion. The same fault is carried still further when we find that each of the orders of mammals requires four decimal places (in Dewey they require one or at most two), and reaches its climax when we arrive at 565.9395 for "Man," and are told it "will want much subdivision."

This is followed by two tables "showing how genera and species might be treated." I have puzzled over these for some time, but cannot make them out; but, as I am given to understand this idea was early dropped for an alphabetical arrangement, any criticism of them is unnecessary.

Time and space fail me to go into further details; but to sum up, the Dewey classification is not perfect, but has been long before the public and has been well tried, it may be had in print with an elaborate index, it is simple and consistent and is based upon practical experience of the subjects on which books and memoirs actually have been written, and of the proportional numbers required by each topic. The Royal Society's classification, so far as I have examined it, has none of these advantages: it is crude, incomplete, and inconsistent, largely because it is the result, not of practical experience, but of *à priori* consideration. I conclude with two passages from Dewey's own Introduction to the fourth edition of his tables:—

"The inexperienced user is very likely to feel entirely competent, after once reading the tables . . . to institute a series of improvements. Experience proves that nothing could be more disastrous. . . . Frequently, proposed changes, carefully studied out and submitted as improvements, are shown by our old records to have been adopted and used in the exact form proposed till considerations which had not been foreseen forced us to change the form as printed. Even after years of experience one is not safe in pronouncing on an apparent improvement without consulting the voluminous records of previous experiments."

"To make out a new set of heads would involve labor and cost vastly beyond the dreams of any person who has not tried exactly this work. The time actually spent on the tables as here printed, by various competent workers, would aggregate several years and cost thousands of dollars. The uniform and urgent advice of the experienced is to adopt a poorer scheme already made rather than undertake so herculean a labor. When done, the maker may possibly be better suited with it, but it is doubtful if many others will be. It is vastly wiser for any man whose time is of value, to use it in something more practically useful to himself and his library than in trying to construct a 'satisfactory' scheme of classification. No one ever yet wholly suited himself or any one else, and probably no one ever will. By adopting this scheme already workt out he saves much time and money, gains the immense advantage of using a system in common with hundreds of others, so that he may utilise their labors and investigations and share with them the economies of co-operation."

The Manchester Museum. WM. E. HOYLE.

WE are glad that we have succeeded in obtaining the foregoing article from Mr. Hoyle. Since the International Conference on scientific bibliography, to be held at the rooms of the Royal Society of London, on July 14 and following days, will probably spend much of its time in discussing what system of numerical indexing can be applied to the multifarious subjects of modern science, and since, so far as our experience goes, the majority of practical scientific men are not likewise practical bibliographers, we venture to think that Mr. Hoyle is doing a public service in furnishing this concise exposition of the Dewey system, and in showing how the substitutes hitherto proposed are found wanting from the practical point of view. In justice, however, to the compilers of the various schemes issued under the auspices of the Royal Society, it should be pointed out that these were merely intended to serve as a basis for discussion; and perhaps nothing worse should be said of them than that their compilation was a waste of time, since the basis of discussion ought properly to have been the Dewey classification itself. Moreover, the conflict between our contributor and the members of the Royal Society Committee is a very unequal one; for Mr. Hoyle has had more practical experience of the Dewey system than perhaps anybody in England, whereas the very distinguished gentlemen whose names are attached to the schemes which the Royal Society has submitted for criticism are the last people in the world to claim for themselves an acquaintance with practical bibliography in general, or with the Dewey system in particular.

It would be easy for us to add to the criticisms which Mr. Hoyle has already made, and to show many more points of inconsistency which the schemes offer, both with one another and with the Dewey system itself; but our space is too valuable to discuss propositions which it would never be possible to uphold seriously against some of the competent librarians and bibliographers who have been appointed by their respective governments to attend the Conference at Burlington House. Instead of criticising the details, we prefer to contrast this characteristically English mode of proceeding with the methods adopted by an eminent foreign bibliographer. For it is—is it not?—a thoroughly English custom to appoint a man who has spent his life in one branch of study to conduct skilled operations in an entirely different field. There is no doubt that, from the point of view of the newspaper public, the man who has got his first in the school of *literæ humaniores* at Oxford, will write a better leading article on, say, the potato disease than your mere biologist; but the journalistic method of getting up a subject in an hour or two, with the help of a few books of ready reference, is not the one that commends itself to the professed scientific worker. A better method is that followed by Mr. Marcel Baudouin, of the Institut International de Bibliographie Scientifique de Paris, the editor of *La Bibliographie Scientifique*, *Les Archives pr. de Chirurgie*, and the *Revue des Instruments de Chirurgie.* In the *Revue Scientifique* for May 30 he publishes various additions to, and further subdivisions of, the Dewey classification, so far as it relates to medical science. The following are the principles which have guided him in the establishment of these additions. Considering himself bound by a resolution passed at the Brussels Conference of bibliographers, to which we have previously referred, he has accepted without question all the indications furnished by Mr. Dewey in the book published by him. "No one," he says, "can accuse me of making innovations in a field that has already been explored and to a certain extent cultivated, or of bringing disturbance into a classification, conventional, it is true, but of which the principle must be admitted in its integrity and without contest for future time." But when he proceeded beyond the tracts already traversed by Dewey and was upon unbroken ground, Mr. Baudouin did not break loose from all restraint and act as an irresponsible innovator; on the contrary: "For these additions," he says, "I have impregnated myself as well as I could with the publications of Mr. Dewey, and the principles which have guided his representatives in Europe. For those parts of which he foreshadowed the possible subdivisions, I have blindly followed his indications, sacrificing my private opinions with the sole object of arriving at an international agreement. For the rest, whenever possible, I have respected the original idea which has ruled over the establishment of this classification in its entirety." Even when making subdivisions which, it might be thought, bore no relation whatever to Dewey's work, Mr. Baudouin has not forgotten what had previously been accomplished. The numbers which he has adopted have not been taken at random, but have been suggested by their use in other parts of the Dewey classification. He has, moreover, used numbers in a similar sense in different parts of his own divisions. It is obvious that this method is of considerable assistance to the memory, and is far superior to the absolute want of agreement which, as Mr. Hoyle has shown, obtains in the schemes put forward by our distinguished countrymen.

There is one sentence in Mr. Hoyle's paper on which we would lay special stress. "The Royal Society's classification fails," he says, "largely because it is the result, not of practical experience, but of *à priori* consideration." This point is emphasised in a letter which we have just received from Dr. Charles Richet, the editor of our esteemed contemporary, the *Revue Scientifique*. He regards it as the chief merit of the Dewey system that it has not been framed in accordance with purely scientific and philosophical ideas, but as the result of the experience of practical librarians. It may further be pointed out that a system which is frankly arbitrary is, for the purposes intended, superior to one that is charmingly philosophical. For our "little systems have their day," and what may seem admirable in the year of grace, 1896, is not likely to be regarded with anything but ridicule by our descendants in 1996. Nature, moreover, as we constantly have reason to regret, does not appear to have been constituted in accordance with our philosophical categories; to take but a single instance, one already hinted at by Mr. Hoyle—what confusion we should see if workers on different groups of the animal kingdom were requested to draw up schemes for the classification of geographical divisions suited to their own requirements!

We venture to summarise the argument by a quotation from the letter that Dr. Charles Richet has kindly addressed to us: "Those who believe it to be their duty to reform this system, or to replace it by another, do not think that the topsy-turvydom produced will have much greater weight than any doubtful progress they may make in the method of classification. After all (1) every classification is defective from the philosophical point of view; (2) every classification would be good if it were employed universally over a wide domain of knowledge. The latter will be the case with the Dewey system if we set ourselves resolutely to make our classification in accordance with his book. To my knowledge there are at least fifteen journals which employ it already."

However, to pass from a detail that can interest but few of our readers, to the other subjects of the Conference,—the following provisional suggestions have been issued by the Committee of the Royal Society. First, as we are glad to note, the idea of including applied science has been given up, and the catalogue is to be restricted to branches of pure science. It is no doubt difficult to distinguish between pure and applied science, but it is equally difficult to distinguish between applied science and mere commercial enterprise; and in confining themselves to pure science the Committee will probably find their task none too easy. Secondly, the catalogue is no longer, like the "Catalogue of Scientific Papers" issued by the Royal Society, to be "confined to papers in certain periodicals, or to books of a certain category." The method now in force at the Concilium Bibliographicum, Zurich, of issuing slips or cards conveying authors' titles, subject-matter, etc., as speedily and as frequently as possible, is proposed to be adopted; while a further issue in book-form may take place at intervals, parts corresponding to the several sciences being, if found desirable, published separately. The circular continues:—

> "That, in order to secure the preparation and publication of such an International Catalogue, a Central Bureau shall be established under the control of an International Council.
>
> "That the whole of the Catalogue shall be prepared and issued subject to the authority of the International Council, and that any particular undertakings which may be allotted to particular countries, institutions, or persons, shall be subsidiary to the work of the Central Bureau and subject to its control.
>
> "That the cost of preparing and publishing the said Slip- and Book-catalogues at the Central Bureau during the years 1900–1904, in so far as these are not met by sales, shall be provided for by means of a guarantee fund, and that application be made to governments, learned societies, institutions, and individuals throughout the world, to assist in establishing such a fund."

Other questions to be decided at the Conference are the place of the Central Bureau, the mode of appointment and organisation of the International Council, the language or languages to be used, and the system of classification to be followed in the subject-index. Since it is difficult to estimate the cost of the work of indexing, it is suggested that a guarantee fund, of about £10,000, should be raised to cover a period of not less than five years, after which time the cost of the enterprise can better be determined.

We may hope that these proposals will be discussed by those whom the scientific world recognises as competent to deal with such peculiarly technical questions. We could name a number of men whose opinions would carry great weight; let us mention the names of M. Baudouin, H. Carrington Bolton, Victor Carus, R. Friedländer, Emil de Margerie, Paul Mayer, Michel Mourlon, S. Nikitin, P. Schiemenz, S. H. Scudder, and O. Taschenberg. We do not mention some skilled bibliographers of our own country, who, till a short time ago, we thought must have been known even to the Council of the Royal Society. By the courtesy of the Secretary of the Royal Society, the list of the delegates already appointed to attend the Conference has been forwarded to us. The names of the delegates for Austria, Germany, and Norway are not yet given. Among the other names, we are glad to see Dr. J. S. Billings and Professor Simon Newcomb, from the United States; Dr. E. W. Dahlgren, the librarian of the Swedish Academy; Professor August Heller, librarian of the Hungarian Academy; Dr. J. Deniker, librarian of the Muséum d'Histoire Naturelle, Paris; and Chevalier Descamps-David and Mr. Paul Otlet, both of the Institut International de Bibliographie at Brussels. But there are also in the list Mr. Avierinos M. Averoff, Greek Consul at Edinburgh; General Annibale Ferrero, Italian Ambassador in London; the Portuguese Minister in London; the Right Hon. Sir J. E. Gorst, M.P., Vice-President of the Committee of Council on Education; the High Commissioner for Canada; the Agent-General for Natal; the Agent-General for New Zealand; the Agent-General for Queensland; and the Swiss Minister in London. These are "all honourable men," deservedly distinguished, but do they know anything of the literature and bibliography of science, or the every-day needs of the working physicist, chemist, and naturalist? If their function is simply to promise the support of their respective governments, especially pecuniary support, then, in the interests of science, we undoubtedly offer them a hearty welcome to London; but when the Conference begins to discuss the Dewey decimal classification, or the best method of indexing new species of animals and plants, we hope that those who know something about the subject will be left to do the talking.

But, once again, to ambassadors, consuls, high commissioners, generals, professors, and librarians, we wish good speed and a successful ending to their discussions.